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BULLETIN

OF THE

TORREY BOTANICAL CLUB.

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Studies in the Botany of the Southeastern United States.—IX.

By John K. Small.

1. THE SESSILE-FLOWERED TRILLIA OF THE SOUTHERN STATES.*

In the spring of 1896, Professor Underwood and the writer independently became interested in a species of *Trillium* native in the southern Atlantic and the Gulf States.† Professor Underwood collected his material in Alabama, while I received specimens collected in western North Carolina, by my friend Mr. A. M. Huger.

The plant in question, judging both from descriptions and specimens preserved in our larger herbaria, has without exception been included in *Trillium sessile*. As I shall show, this is an error, and was committed by Linnaeus himself and both general botanists, and monographers of this group have apparently followed his disposition of the plants to the present time.

Without doubt the original *Trillium sessile* of Linnaeus‡ was a composite species, for after his description, "Trillium flora sessile erecto," he quotes descriptions from the three authors, Gronovius, Plukenet and Catesby, as follows:

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* This study has been furthered by the loan of material from the herbaria of Harvard University and the United States Department of Agriculture.

† After extensive field observations during the spring and summer, Professor Underwood read a paper on the sessile *Trillia* before Section G of the American Association for the Advancement of Science at its last meeting. He expected to finish and publish the results of the study, but, being pressed for time, requested the writer to complete the work already well advanced.

‡ Species Plantarum, 340.

"Paris foliis ternatis, flore sessile erecto. Gron. virg. 44. Solanum virginianum triphyllum, flore tripetalo atropurpureo in foliorum sinu, absque pediculo, sessile. Pluk. alm. 352. t. 111. f. 6. Solanum triphyllum, flore hexapetalo: tribus petalis purpureis, caeteris viridibus reflexis. Catesb. car. 1. p. 50. t. 50."

The habitat given is "Virginia, Carolina." The first of these three descriptions throws little or no light on the subject, but the second and third quotations each refer to a plate. A comparison of these two plates indicates a great discrepancy, the figure of Plukenet representing a small plant with oval leaves, while the Catesby drawing illustrates a large robust plant with ovate-lanceolate leaves. If only these two plates had to be considered, there would be no doubt not only as to there being two distinct species involved, but we should have no trouble in deciding to which plant the name *Trillium sessile* must be applied. The first quoted description being wholly indefinite, left this important question in doubt. In order to settle this point definitely, Dr. Britton sent specimens of both the small and large plants to Mr. Edmund G. Baker, at the British Museum, and I can not do better than print his reply: " * * * * We have the Gronovian plant and also a plant in the Plukenet Herbarium, written up by Plukenet, but not the one apparently the figure was done from, as you will see from the tracing I enclose. The Gronovian and Plukenet plants are fairly similar and more like no. 2 (the small plant with oval leaves) than the much larger no. 1 (the large plant with ovate-lanceolate leaves). Neither of the specimens are particularly good ones, but I have tried to make tracings of them, such as they are, these will show the outline of the leaf if they do nothing else. You may like to have exact measurements of the Plukenet plant: Leaves broadly oval, 2 in. long, breadth $1\frac{7}{12}$ in., sepals $\frac{5}{6}$ in., petals $\frac{11}{12}$ in. * * * * ."

Thus we see that the first and second quoted descriptions in the Species Plantarum are represented by specimens which agree with each other in all essential particulars, while the third quotation is founded wholly on a plate, which represents a species totally distinct from that on which the first and second descriptions were founded. Therefore the name *Trillium sessile* must be associated with the small oval-leaved plant, and the large plant must receive a name, which will appear in the appended synopsis. The solution of this long-standing error naturally excited my interest in this whole group of *Trillium*, and a study of the different species leads me to print the following key and specific descriptions which, I hope, will lead to a better understanding of these interesting plants.

As far as I can see, this group of *Trillium* has always been very unfairly treated; most authors seem to have taken it for granted that the number of species was very limited and that that number could not be naturally increased. If an author did put his convictions in print, described a new species, pointed out excellent characters for a species and distributed specimens, that species was almost certain to find itself in synonymy or reduced to varieta, rank of another species at an early date. This state of affairs continued and reached a climax in Dr. Watson's treatment of the group in his revision of the North American Liliaceae,* where only two forms are given specific rank, while the rest are included in the synonymy or varietal ranks under a much distorted nomenclature, for example, *Trillium viride* Beck appears as a synonym of *Trillium sessile* L., *Trillium discolor* Wray appears as a variety of *Trillium sessile* under the new name *Wrayi*, *Trillium viridescens* Nutt. (*T. viride* Beck) also appears as a variety of the Linnaean species under the new name *Nuttallii* and *Trillium lanceolatum* Boykin mss. is set down as a variety of *Trillium recurvatum*, which is fortunate enough to have retained specific standing.

Key to the Species.

Petals sessile, of one color throughout.
  Sepals oblong or oblong lanceolate; petals broadly spatulate. 1. *T. discolor.*
  Sepals lanceolate; petals lanceolate, elliptic or oblanceolate.
    Leaves oval or suborbicular, 4–8 cm. long; anthers 3–4 times longer than the filaments; styles elongated, nearly straight. 2. *T. sessile.*
    Leaves ovate-lanceolate to ovate-orbicular, 8–18 cm. long; anthers subsessile; styles almost wanting, stigmas recurved. 3. *T. Underwoodii.*
Petals clawed, the blade and claw often of different colors.
  Leaves sessile; blades of the petals linear or linear-oblong.
    Stems rough pubescent at least above; leaves ovate or oblong; sepals 2.5–5 cm. long; filaments—$\frac{1}{4}$–$\frac{1}{5}$ shorter than the anthers. 4. *T. viride.*
    Stems smooth; leaves lanceolate or elliptic; sepals 2–2.5 cm. long; filaments about as long as the anthers. 5. *T. lanceolatum.*
  Leaves petioled; blades of the petals ovate, elliptic or obovate. 6. *T. recurvatum.*

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* Proc. Am. Acad. 14: 213–303.

1. TRILLIUM DISCOLOR Wray; Hook. Bot. Mag. *pl. 3097.* 1831.[*]

Trillium sessile var. *Wrayi* S. Wats. Proc. Am. Acad. 14: 273. 1879.

Perennial by a rootstock, bright green, glabrous. Stems erect, 1–2 dm. tall, smooth; leaves oval, 6–7 cm. long, obtuse, or short-acuminate, 3–5-nerved, mottled, rounded at the base, sessile; flowers sessile; sepals oblong or oblong-lanceolate, 2 cm. long, obtuse or acute, spreading; petals broadly spatulate, about ⅓ longer than the sepals, greenish, sessile, rounded and one prominently apiculate at the apex; stamens less than ½ as long as the petals, the filaments nearly wanting; berry not seen.

Georgia.

Apparently a rare species and not lately collected, but very distinct, differing from all its relatives in the peculiar broadly spatulate petals, one of which is distinctly apiculate.

2. TRILLIUM SESSILE L. Sp. Pl. 340. 1753.

Perennial by an erect or ascending corm-like rootstock, deep green, glabrous. Stems solitary or clustered, erect, 1–2 dm. tall, slender; leaves oval or suborbicular, 4–8 cm. long, obtuse or acute, rounded at the base, sessile, 3–5 nerved, not mottled; flowers sessile; sepals lanceolate, 2–3 cm. long, acute or acutish; petals narrowly elliptic, slightly shorter than or longer than the sepals, sessile, acutish, purple; stamens about ½ as long as the petals; filaments dilated at the base, ⅓–¼ shorter than the anthers; styles elongated, nearly straight, berry not seen.

In woods, Pennsylvania to Minnesota, south to Florida and Mississippi. April and May.

3. TRILLIUM UNDERWOODII n. sp.

Perennial by a horizontal rootstock, bright green, glabrous. Stems solitary or clustered, 1–3 dm. tall, stout; leaves varying from ovate-lanceolate to ovate-orbicular, 8–18 cm., long, acute or short-acuminate, undulate, sometimes crisped, with a velvety lustre, mottled with 3 shades of green, rounded or subcordate at the base, sessile; flowers sessile, musk-scented; sepals lanceolate, 4.5–5.5 cm. long, obtuse or acute, erect or spreading, green or purplish-green; petals lanceolate, elliptic or oblanceolate, 5.5–8.5 cm. long, sessile, acute or obtuse, erect, purple; stamens 3–4 times shorter than the petals, filaments very short, anthers 1.5–2 cm. long, subsessile; styles almost wanting; stigmas recurved; berry ovoid.

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[*] I am indebted to Dr. B. L. Robinson for a tracing of the original plate of *Trillium discolor.*

In woods and fields, North Carolina to Tennessee, south to Florida and Alabama. April and May. Ascends to 950 metres in North Carolina. *Trillium sessile* and *Trillium Underwoodii* are remarkably constant in comparative size. The two species can readily be segregated on size and habit alone and of course comparative measurements of organs would serve as an excellent basis of separation. But this is not necessary since we have such good specific characters as exist in the flower, especially as respects the stamens and styles.

4. TRILLIUM VIRIDE Beck, Am. Jour. Sci. 11 : 178. 1826.

Trillium viridescens Nutt. Trans. Am. Philos. Soc. (II.) 5 : 155. 1837.

Trillium sessile var. *Nuttallii* S. Wats. Proc. Am. Acad. 14 : 273. 1879.

Perennial by a short corm-like rootstock, bright green, more or less pubescent. Stems solitary, or several together, 1–4 dm. tall, purple, rough-pubescent at least near the top; leaves oblong, ovate, or broadly ovate, 5–11 cm. long, acute or obtusish, 3–5-nerved, usually blotched, more or less pubescent on the nerves beneath, abruptly short-attenuate at the base; flowers sessile; sepals linear or linear-lanceolate, 2.5–5 cm. long, bright green, acute or obtuse, erect or spreading; petals clawed, the blades linear or nearly so, 2.5–6 cm. long, surpassing the sepals, light green or purplish green, acute or obtuse, on brown or purple claws; stamens about ⅓ as long as the petals; filaments flattened, ¼–⅕ shorter than the anthers; berry not seen.

In woods and glades, Missouri to Tennessee, south to Mississippi and Arkansas. April and May.

Prof. Beck published a good description of this species in the year 1826. Mr. Nuttall described an apparently extreme form of the same species eleven years later. With these two full descriptions and the original specimens of Mr. Nuttall extant, it seems strange that *Trillium viride* Beck, and *Trillium viridescens* Nutt., being one and the same species, should, on the one hand, be made a synonym and on the other a variety of a species to which it is only distantly related; the clawed petals, among many other characters, primarily prevent it being associated with *Trillium sessile.* Its true relationship is with *Trillium recurvatum.*

Mr. Nuttall collected the original specimens of *Trillium viri-*

descens in Arkansas, and of this collection there are good specimens preserved. Prof. Beck's plants came from St. Louis and, although I have not seen his original specimens, we have a specimen from the same place collected by Riehl in 1841, and, in addition to this, Mr. Henry Eggert has sent me excellent material from the vicinity of St. Louis collected during the past few years. All these plants, as well as those from the extremities of the known geographic range cited above, agree with each other in essential specific characters.

5. TRILLIUM LANCEOLATUM Boykin; S. Wats. Proc. Am. Acad. 14: 274. As synonym. 1879.

Trillium recuratum var. (?) *lanceolatum* S. Wats. Proc. Am. Acad. 14: 273. 1879.

Perennial by a rootstock, bright green, glabrous. Stems erect, 1–4 cm. long, slender, purplish, smooth; leaves lanceolate or elliptic, 7–9 cm. long, acute or acutish, more or less constricted at the base, sessile; flowers sessile; sepals linear or linear-lanceolate, 2–2.5 cm. long, acute, green, spreading; petals clawed, 3–3.5 cm. long, the blades linear or linear-oblong, acute, the claws about twice as long as blades; stamens about ⅓ as long as the petals; filaments about as long as the more or less incurved anthers; berry not seen.

In moist woodlands and river bottoms, Georgia to Alabama, and Louisiana. (?) April and May.

The following label accompanying Dr. Boykins' original specimen may be of interest: "*Trillium lanceolatum.* This is certainly a new species of sessile *Trillium.* It grows universally in stiff clayey river bottoms. Flowers March and April. The fruit is more bellied than S. Trillium, and deep grooving formed by the stamina, rendering it hexagonal. Stamina incurved."

6. TRILLIUM RECURVATUM Beck, Am. Journ. Sci. 11: 178. 1826.

Trillium unguiculatum Nutt. Trans. Am. Philos. Soc. (II.) 5: 154. 1837.

Perennial by a short horizontal rootstock, light green, glabrous. Stems solitary, or several together, 1–4 dm. tall, smooth, usually slender; leaves petioled, the blades ovate-lanceolate, oval or suborbicular, obtuse or acute, 5–9 cm. long, rounded or sub-cordate at the base or rarely attenuate, often mottled; petioles winged, several times shorter than the blades; flowers sessile, purple ; sepals lanceolate, 2–3 cm. long, acute, finally deflexed ; petals clawed, the blades ovate, obovate or elliptic, usually acute, about twice longer than the claws ; stamens hardly ½ as long as the petals ; filaments about ½ or ⅓ as long as the more or less incurved anthers ; berry not seen.

In woods, Ohio to Minnesota, south to Mississippi and Arkansas. April and May.

2. NOTES ON CRITICAL SPECIES.

IRIS VERNA L. Sp. Pl. 39. 1753.

I have seen two collections of the spring Iris during the past season, both from North Carolina ; the one was made by Mr. A. M. Huger in the mountains and the other by myself in the central part of the State. I find that two of its striking features have not been recorded : first, the remarkable elongation of the leaves, which often reach a length of 3–4 decimeters, and second, the odor of the flowers, which almost exactly imitates the fragrance of sweet violets.

ANEMONE TRIFOLIA L. Sp. Pl. 540. 1753.

While walking along a small stream just west of the Falls of the Yadkin river, last spring I was astonished to find fine plants of *Anemone trifolia*. The species has only been known to exist in America on the higher parts of the Alleghanies, chiefly in the Southern States, but here, in the central part of North Carolina at an elevation of only 200–300 feet above the level of the sea, the species appears as typical as anywhere.

CARDAMINE PARVIFLORA L. Sp. Pl. Ed. 2, 914. 1763.

Virginia seems to have been the southern recorded limit for this species but now Mr. A. M. Huger sends us good specimens from the mountains of Polk County, North Carolina.

DIAMORPHA PUSILLA Nutt. Gen. 1 : 293. 1818.

The geographic range of this curious plant is gradually expanding. I have recently found the species at various points in northern Georgia and in 1894 and 1895 met with it on Dunn's Mountain in Rowan County, North Carolina. The outlying stations of its distribution as we have it represented by specimens are :

Cumberland Mountains, Tennessee, Prof. Kirby Smith.
Mountains of North Carolina, Mr. G. R. Vasey.
Habersham County, Georgia, Mr. Buckley.
Warren County, Georgia, Dr. Chapman.
Stone Mountain and vicinity, Georgia, various collectors.

WALDSTEINIA FRAGARIOIDES (Michx.) Tratt. Ros. Mon. 3: 107. 1823.

Like *Anemone trifolia* this is normally an Alleghanian species, but I have found quantities of it in the central part of North Carolina growing in dark ravines which branch from the cañon at the Falls of the Yadkin. The altitude of the locality is little over 150 feet.

OXALIS RECURVA Ell. Bot. S. C. & Ga. 1: 526. 1821.

During the summer of 1895 I collected a few specimens of this beautiful and strongly characterized *Oxalis* at Stone Mountain and in the vicinity of Augusta, Georgia.

MONOTROPSIS ODORATA Ell. Bot. S. C. & Ga. 1: 479. 1817.

This rare plant has lately been rediscovered by Mr. A. M. Huger on the mountains of Polk County, North Carolina.

SCUTELLARIA CAMPESTRIS Britton, Mem. Torr. Club. 5: 283. 1894.

In former papers of this series I have reported a number of typically prairie plants which occur east of the Appalachian mountain system ; *Scutellaria campestris* must now be added to the increasing list. In April, 1896, I found several patches above the bluffs at the Falls of the Yadkin River, North Carolina. The latest record of its distribution is given by Drs. Watson and Coulter* as southern Illinois and Kansas. Both Prof. Bain and Mr. Bicknell have collected specimens in Tennessee. It is an excellent species and doubtless has a considerably wider range than our present material indicates.

3. NOTES ON EPILOBIACEAE.

The genus *Ludwigia* as it is now generally interpreted has always seemed to me to contain too many distinct generic types.

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* A. Gray, Man. Ed. 6. 418.

I think Linnaeus' idea of holding *Isnardia palustris* generically separate from *Ludwigia alternifolia* is the proper way of disposing of these widely divergent species and their respective relatives. There are three clear generic lines in *Ludwigia* as it is limited by most authors and I think it is much more satisfactory to treat these groups as separate genera than to associate them as subgenera in a composite genus.

I append a synopsis which will serve to emphasize the diagnostic characters:

Leaves opposite; stems prostrate or decumbent, creeping or floating.
  Flowers sessile; petals wanting or very small; leaves petioled; capsules short, sessile, straight, with a flat or depressed top. 1. *Isnardia.*
  Flowers long-stalked; petals large and conspicuous; leaves sessile; capsules elongated, long-stalked, curved, with a prominent 4-lobed stylopodium. 2. *Ludwigantha.*
Leaves alternate; stems erect or ascending. 3. *Ludwigia.*

1. ISNARDIA L. Sp. Pl. 120. 1753.

Key to the Species.

Petals usually none; capsules 2.5–4 mm. long.
  Pubescent; capsules 2.5–3 mm. long. 1. *I. spathulata.*
  Glabrous; capsules 3–4 mm. long. 2. *I. palutris.*
Petals usually present; capsules 6–7 mm. long. 3. *I. natans.*

1. Isnardia spathulata (T. & G.).

Ludwigia spathulata T. & G. Fl. N. A. 1: 526. 1840.
Around pine barren ponds, middle Florida.

2. Isnardia palustris L. Sp. Pl. 120. 1753.

Ludwigia apetala Walt. Fl. Car. 89. 1788.
Ludwigia nitida Michx. Fl. Bor. Am. 1: 57. 1803.
Ludwigia palustris Ell. Bot. S.C. & Ga. 1: 211. 1817.
Isnardia palustris var. *Americana* DC. Prodr. 3: 61. 1828.
Isnardia ascendens Hall; Eaton & Wr. N. A. Bot. 285. 1840.
Ditches, streams and ponds, throughout eastern North America.

3. Isnardia natans (Ell.).

Ludwigia natans Ell. Bot. S. C. & Ga. 1: 518. 1817.
Streams and marshes, North Carolina to Florida and Mexico.

2. LUDWIGIANTHA.

[*Ludwigia*, section *Ludwigiantha* T. & G. Fl. N. A. 1 : 526. 1840.]

1. LUDWIGIANTHA ARCUATA (Walt.).

Ludwigia arcuata Walt. Fl. Car. 89. 1788.
Ludwigia pedunculosa Michx. Fl. Bor. Am. 1: 88. 1803.
Isnardia pedunculosa DC. Prodr. 3: 60. 1828.
Swamps and marshes, Virginia to Florida.

3. LUDWIGIA L. Sp. Pl. 118. 1753.

Represented by fifteen species in the southern United States.

An ecological Study of the Genus Talinum with Descriptions of two Species.

BY J. W. HARSHBERGER.

(PLATE 299.)

There are admitted by Engler and Prantl in their voluminous work, "Die Natürlichen Pflanzenfamilien," seventeen genera of the family Portulacaceae, and, according to the Index Kewensis, the distribution of the species of these several genera is as follows:

Genus.	Number of Species.	Western Hemisphere including N. and S. America and Islands.	Eastern Hemisphere including Asia, Africa, Europe and Oceanica.
1. Talinum	30	25	5
2. Calandrinia . .	125	100	25
3. Spraguea . . .	2	2	—
4. Calyptridium. .	3	3	—
5. Talinopsis . . .	1	1	—
6. Pleuropetalon .	2	2	—
7. Grahamia . . .	1	1	—
8. Anacampseros .	12	—	12
9. Claytonia . . .	25	21	4
10. Hectorella. . .	2	—	2
11. Montia	—	—	—
12. Monocosmia . .	2	2	—
13. Silvaea	4	4	—
14. Portulacaria . .	2	—	2
15. Talinella . . .	1	—	1
16. Portulaca . . .	54	20	34
17. Lewisia	2	2	—
	268	183	85